Final
Determination of Compliance

(Final New Source Review Document)

High Desert Power Project
Victorville, California

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List of Abbreviations

ATCM	Airborne Toxic Control Measure
BACT	Best Available Control Technology
CEC	California Energy Commission
CO	Carbon Monoxide
CTG	Combustion Turbine Generator
HDPP	High Desert Power Project
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
LAER	Lowest Achievable Emission Rate
MDAQMD	Mojave Desert Air Quality Management District
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
O_2	Molecular Oxygen
PM_{10}	Fine Particulate, Respirable Fraction
PSD	Prevention of Significant Deterioration
SCIA	Southern California International Airport
SCR	Selective Catalytic Reduction
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
STG	Steam Turbine Generator
TOG	Total Organic Gases
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

1. Introduction

The Mojave Desert Air Quality Management District (MDAQMD) received an Application for New Source Review for the High Desert Power Project (HDPP) from the HDPP, LLC dated October 10, 1997. The HDPP application detailed three possible final configurations for the project, with the understanding that the proponent will select one configuration prior to the commencement of construction. The MDAQMD notified the applicant that this application was complete with a letter dated November 19, 1997.

The MDAQMD issued a Preliminary Determination of Compliance (PDOC) for the HDPP on May 14, 1998. Significant comments were received regarding the PDOC, and HDPP, LLC made substantial changes to the proposed project (including removing the simple cycle configuration from the proposal on July 8, 1998). The MDAQMD then issued a Revised Preliminary Determination of Compliance (RPDOC) for the HDPP on December 16, 1998. Significant comments were received regarding the RPDOC, and HDPP, LLC has made substantial changes to the proposed project. The MDAQMD then issued a Second Revised Preliminary Determination of Compliance (SRPDOC) for the HDPP on May 18, 1999. Minor comments were received regarding the SRPDOC. This document represents the final new source review document, or Final Determination of Compliance (FDOC), for the proposed project.

As required by MDAQMD Rule 1306(E)(1)(a), this document reviews each HDPP configuration, evaluates worst-case or maximum air quality impacts, and establishes control technology requirements and related air quality permit conditions for each configuration. This document represents the final pre-construction compliance review of the proposed project, and determines that construction and operation of the proposed project will comply with all applicable MDAQMD rules and regulations.

2. Project Location

The HDPP will be located on a 25 acre site on the Southern California International Airport (SCIA), formerly known as George Air Force Base. SCIA is located in the northwest corner of the City of Victorville. The HDPP will be built on Parcel No. 0468231-01, a portion of Parcel 1 of section 24, at Township 6 North, Range 5 West (San Bernardino Base and Meridian) in the County of San Bernardino, California.

Site Description

The HDPP site under each configuration will include combustion turbine trains with exhaust stacks, heat recovery steam generator units, steam turbine generator units, cooling towers, water treatment, transformers, and a 230kV high voltage switchyard.

A combined control room and administrative building and a combined warehouse/shop building will be located on the project site. An above-ground rack system will support piping, cable, and wiring. A microwave tower at the project site will provide off-site communication. Perimeter and internal paved roads within the plant will provide vehicle and maintenance equipment access. Natural gas will be delivered to the plant site boundary by a new 24-inch line

approximately 2.75 miles long which will be constructed by Southwest Gas Corporation. A 32 mile pipeline may be constructed to obtain additional natural gas from the PG&E and/or Kern River pipelines near California Highway 58.

3. Description of Project

The HDPP proposes to construct an electrical generating facility employing natural gas-fueled combined-cycle gas combustion turbines as its primary generating units. The HDPP is intended to sell electricity via bilateral power sales agreements to the regional power pool and other consumers. Commercial operation is scheduled to commence in 2002. Due to the uncertainties introduced by deregulation of the utility industry, HDPP is considering two plant configurations. The specific configuration will not be selected until there is greater certainty of the actual market need.

4. Project Configurations

The two proposed plant configurations involve variations in the number and class of combustion turbine generators (CTGs). The two conceptual designs are as follows.

- Three F-class CTGs operating in combined cycle mode (the 3F Combined)
- Two G-class CTGs operating in combined cycle mode (the 2G Combined)

For both configurations, the CTGs will be exclusively fueled by pipeline-quality natural gas, without back-up liquid fuel firing capability.

Since HDPP has not made the final turbine vendor selection at this time, the parameters used herein for purposes of evaluation can be considered to define an operating envelope for each configuration. Only equipment which can operate within the operating envelope (and permit conditions) for the configuration selected for construction will be permitted. Vendors and equipment currently under consideration include, but are not limited to: General Electric Frame 7FA, Westinghouse 501F and Westinghouse 501G.

Each configuration employs CTGs as the primary heat source. The CTG power blocks each include a turbine air compressor section, gas combustion system combustors, power turbine, and a 60-hertz generator. Ambient air is filtered and compressed in a multiple-stage axial flow compressor. Compressed air and natural gas are mixed and combusted in the turbine combustion chamber. Lean pre-mix low NO_x combustors are used to minimize NO_x formation during combustion. Exhaust gas from the combustion chamber is expanded through a multi-stage power turbine which drives both the air compressor and the electric power generator. Heat from the exhaust gas is then recovered in a heat recovery steam generator (HRSG) which feeds a steam condensing turbine (STG) driving an electric generator. Supplemental heat will be provided to the HRSG by duct burners under some circumstances.

Project Configuration #1 – Combined Cycle (Three F Class)

This project configuration will employ three F-class CTGs operating in combined (or combined Brayton and Rankine) cycle mode (with auxiliary systems). Each CTG will exhaust into a Heat Recovery Steam Generator (HRSG). The steam generated will drive a condensing Steam Turbine Generator (STG). Each condensing STG will be cooled by a cooling tower. This configuration will produce approximately 750 MW at 59°F ambient. This project configuration will have an expected availability of 95 percent and operate up to 8,322 hours each year.

Each HRSG is a horizontal, natural circulation type unit with three pressure levels of steam generation, a reheat loop and an integral de-aerator. A duct burner in each HRSG will provide supplementary firing during high ambient temperatures to maintain constant steam production to the STG. A Selective Catalytic Reduction (SCR) system and high-temperature oxidation catalyst will be located within each HRSG. High and low pressure steam will be produced in each HRSG and flow to a STG. Each STG will drive an electric generator to produce electricity. STG exhaust steam will be condensed in a surface condenser with water from a dedicated multi-cell wet cooling tower.

This 3F Combined configuration consists of equipment having the following 15 application numbers:

- 98001134 Combustion Turbine 3F-1
- 98001135 Duct Burner 3F-1
- 98001136 SCR Unit 3F-1
- 99003920 Oxidation Catalyst 3F-1
- 98001137 Cooling Tower 3F-1
- 98001138 Combustion Turbine 3F-2
- 98001139 Duct Burner 3F-2
- 98001140 SCR Unit 3F-2
- 99003921 Oxidation Catalyst 3F-2
- 98001141 Cooling Tower 3F-2
- 98001142 Combustion Turbine 3F-3
- 98001143 Duct Burner 3F-3
- 98001144 SCR Unit 3F-3
- 99003922 Oxidation Catalyst 3F-3
- 98001145 Cooling Tower 3F-3

Project Configuration #2 – Combined Cycle (Two G Class)

This project configuration will employ two G-class CTGs operating in combined (or combined Brayton and Rankine) cycle mode (with auxiliary systems). Each CTG will exhaust into an HRSG. The steam generated will drive a condensing STG. Each condensing STG will be cooled by a cooling tower. This configuration will produce approximately 700 MW at 59°F ambient. This project configuration will have an expected availability of 95 percent and operate up to 8,322 hours each year.

Each HRSG is a horizontal, natural circulation type unit with three pressure levels of steam generation, a reheat loop and an integral de-aerator. A duct burner in each HRSG will provide supplementary firing during high ambient temperatures to maintain constant steam production to the STG. An SCR system and high-temperature oxidation catalyst will be located within each HRSG. High and low pressure steam will be produced in each HRSG and flow to a STG. Each STG will drive an electric generator to produce electricity. STG exhaust steam will be condensed in a surface condenser with water from a dedicated multi-cell wet cooling tower.

This 2G Combined configuration consists of equipment having the following ten application numbers:

- 98001146 Combustion Turbine 2G-1
- 98001147 Duct Burner 2G-1
- 98001148 SCR Unit 2G-1
- 99003923 Oxidation Catalyst 2G-1
- 98001149 Cooling Tower 2G-1
- 98001150 Combustion Turbine 2G-2
- 98001151 Duct Burner 2G-2
- 98001152 SCR Unit 2G-2
- 99003924 Oxidation Catalyst 2G-2
- 98001153 Cooling Tower 2G-2

Overall Project Emissions

In summary, the HDPP configurations differ in terms of the number and type of primary generating units, employed in a common combined cycle natural gas-fired turbine generation scheme. These differences result in somewhat different maximum annual criteria emissions. All configurations will produce exhaust emissions during three performance modes: startup; operations mode; and shutdown. Both configurations feature the operation of a wet cooling tower with associated entrained particulate emissions.

Maximum Annual Emissions

Table One presents maximum annual facility operational emissions for each configuration. Maximum annual NO_x, CO and VOC emissions are calculated by assuming five cold starts, 35 warm starts, 60 hot starts, 100 shutdowns and 6456 hours of operation at the 59° F hourly rate. Maximum annual SO_x and PM_{10} emissions are calculated by assuming 8322 hours of operation at the 59° F hourly rate. The maximum cooling tower PM_{10} emissions are calculated by assuming 8760 hours of operation and are included in the facility totals. Maximum total SO_x emissions are presented as 14 tpy, but approximately 9 tpy of these emissions are assumed to be converted to particulate and are also accounted for in the PM_{10} emissions.

Table 1 - HDPP Maximum Annual Operational Emissions (tons per year)					
	NO_x	**CO**	**VOC**	**SO_x**	**PM_{10}**
3F Combined	205	750	129	14	233
2G Combined	189	484	83	12	219

Maximum Daily Emissions

Table Two presents maximum daily combustion turbine generator emissions for each configuration. Maximum daily NO_x, CO and VOC emissions are calculated by assuming one cold start, one hot start, two shutdowns and 18.5 hours of operation at the 32° F hourly rate (absolute worst case emissions). Maximum daily SO_x and PM_{10} emissions are calculated by assuming 24 hours of operation at the 32° F hourly rate (absolute worst case emissions).

Table 2 – CTG Maximum Daily Emission Rates (per turbine) All values in pounds per calendar day					
	NOx	**CO**	**VOC**	**SOx**	**PM_{10}**
F-Class CTG	848	8072	1448	27	435
G-Class CTG	1495	10619	1648	36	610

Equivalent Hourly Emission Rates

Table Three presents maximum hourly emission rates for each configuration in operational mode. These rates represent operation of the combustion turbine generator at 59° F. Each cooling tower will emit a maximum of 1.1 pounds of PM_{10} per hour in the 3F Combined configuration and 1.6 pounds of PM_{10} per hour in the 2G Combined configuration. Cooling tower emissions are not included in this table.

Table 3 - HDPP Operational Mode Hourly Emission Rates (per turbine) All values in pounds per hour					
Configuration	NO_x	CO	VOC	SO_x	PM_{10}
F-Class CTG	18.00	17.53	2.51	1.11	18.14
G-Class CTG	24.55	23.91	3.42	1.51	25.41

5. Control Technology Evaluation

Best Available Control Technology (BACT) is required for any new facility that emits, or has the potential to emit, 25 pounds per day or more or 25 tons per year or more of any non-attainment pollutant or its precursors (MDAQMD Rule 1303(A)). Based on the proposed project's maximum emissions as calculated in §4 above, each permit unit at the proposed HDPP must be equipped with BACT/Lowest Achievable Emission Rate (LAER) for NO_x, VOC, PM_{10} and SO_x and BACT for CO. The applicant has submitted a BACT analysis[1] which evaluates the available control technologies for these pollutants, trace organics, and trace metals for each configuration.

[1] "High Desert Power Project Control Technologies Evaluation," ENSR Corp., ENSR Doc. No. 8700-835-400-BACT, January 1998.

The applicant subsequently submitted a supplemental BACT analysis to address the revised project.[2] These BACT analyses also include a listing of previous BACT/LAER determinations for gas turbines from USEPA's BACT/LAER Clearinghouse.

HDPP has also committed to BACT/LAER limits specified by USEPA.[3]

NO_x BACT

NO_x is a precursor of ozone and PM_{10}, and both ozone and PM_{10} are non-attainment pollutants at the proposed facility location. NO_x will be formed by the oxidation of atmospheric nitrogen during combustion within the gas turbine generating systems.

The MDAQMD has reviewed recent gas turbine NO_x BACT determinations, including recommendations by USEPA and CARB. On June 12, 1998 the SCAQMD recognized a BACT guideline value of 2.5 ppm NO_x (corrected to 15% O_2) for natural gas-fired turbines. USEPA has identified an "achieved in practice" BACT value of 2.0 ppmv over a three-hour rolling average based on the recent performance of a Vernon, California natural gas-fired 32 megawatt combined cycle turbine (without duct burners) equipped with the patented SCONOX system. USEPA has accepted 2.5 ppmv over a one-hour average as equivalent to the lower standard at the three hour averaging time. Brooklyn Navy Yard Cogeneration Partners represents the most stringent gas turbine NO_x limit in the BACT/LAER clearinghouse at 3.5 ppm (corrected to 15% O_2) and averaged over one hour. After discussion and agreement with USEPA, the HDPP proposes 2.5 ppmvd (corrected to 15% O_2) over a one hour averaging time with an ammonia slip of 10 ppmvd (corrected to 15% O_2), except during periods of start-up, shutdown and malfunction, as a NO_x BACT emission limit. Due to the technology-forcing nature of this proposed limit, malfunctions include temporary excursions due to the turbine switching from lean pre-mix to diffusion mode.

Therefore the District has determined that a maximum NO_x concentration of 2.5 ppmvd (corrected to 15% O_2) averaged over one hour, with an ammonia slip of 10 ppmvd (corrected to 15% O_2) averaged over three hours is acceptable as NO_x BACT for the combined cycle, duct burner equipped, natural gas-fired >100 megawatt gas turbines.

CO BACT

Carbon monoxide is formed as a result of incomplete combustion of fuel within the gas turbine generating systems. CO is an attainment pollutant at the proposed facility location.

The MDAQMD has reviewed recent gas turbine CO BACT determinations, including recommendations by USEPA and CARB. On June 12, 1998 the SCAQMD recognized a BACT guideline value of 10 ppmvd CO (corrected to 15% O_2 with no averaging time specified) for natural gas-fired turbines. Newark Bay Cogeneration Partners represents the most stringent gas turbine CO limit in the BACT/LAER clearinghouse at 1.8 ppmvd for a CO nonattainment area.

[2] High Desert Power Project Emissions and BACT Addendum," ENSR Corp., ENSR Doc. No. 8700-835-400R2, October 1998.
[3] Letter from A. Welch (HDPP) to A. De Salvio (MDAQMD) dated 4/28/99.

Because HDPP is in a CO attainment area, the HDPP proposes 4 ppmvd (corrected to 15% O_2) over a twenty-four hour averaging time as a CO BACT emission limit with a high temperature oxidation catalyst (the oxidation catalyst will be optimized for VOC oxidation). CARB has provided source test data for gas turbines that suggests that the oxidation catalyst proposed by HDPP will not result in CO concentrations in excess of 4 ppmvd.

Therefore the District has determined that a maximum CO concentration of 4 ppmvd (corrected to 15% O_2) averaged over twenty-four hours is acceptable as CO BACT for the combined cycle, duct burner equipped, natural gas-fired >100 megawatt gas turbines.

PM_{10} BACT

PM_{10} is a non-attainment pollutant at the proposed facility location. Particulate will be emitted by the gas turbine generating systems due to fuel sulfur, inert trace contaminants, mercaptans in the fuel, dust drawn in from the ambient air and particulate of carbon, metals worn from the equipment while in operation, and hydrocarbons resulting from incomplete combustion. Particulate will also be emitted by the cooling towers through particulate mist entrainment.

Gas Turbines

There have not been any add-on control systems developed for gas turbines from the promulgation of the first New Source Performance Standard for Stationary Turbines (40 CFR 60 Subpart GG, commencing with §60.330) in 1979 to the present. The cost of installing such a device has been and continues to be prohibitive and performance standards for particulate control of stationary gas turbines have not been proposed or promulgated by EPA.

The most stringent particulate control method for gas turbines is the use of low ash fuels such as natural gas. No add-on control technologies are listed in the EPA BACT/LAER Clearinghouse listing provided by the applicant, and only 37 of the 80 turbine listings have PM limits. Combustion control and the use of low or zero ash fuel (such as natural gas) is the predominant control method listed for turbines with PM limits.

The District determines that the sole use of natural gas fuel is acceptable as PM_{10} BACT for the combined cycle, duct burner equipped, natural gas-fired >100 megawatt gas turbines.

Cooling Towers

Cooling towers will be equipped with mist eliminators guaranteed by the manufacturer to limit drift to 0.0006 percent. The applicant proposes a total dissolved solid limit of 4,000 milligrams per liter, a maximum water use of 90.351 billion gallons per year per tower (based on a recirculation rate of 57,300 gallons per minute (gpm) per cooling tower on an annual basis) in the 3F configuration and a maximum water use of 77.305 billion gallons per year per tower (based on a recirculation rate of 73,540 gpm per cooling tower on an annual basis) in the 2G configuration.

The District determines that these parameters are acceptable as PM_{10} BACT for this project's cooling towers.

SO_x BACT

SO_x is a precursor to PM_{10}, a non-attainment pollutant at the proposed facility location. SO_x is exclusively formed through the oxidation of sulfur present in the fuel.

The emission rate is a function of the efficiency of the source and the sulfur content of the fuel, since virtually all fuel sulfur is converted to SO_x. The gas turbines will be fired exclusively with natural gas which typically contains an average of 30 ppm by weight of sulfur, and will be limited to 0.2 grains of sulfur per 100 dry standard cubic feet by permit condition.

The District determines that the exclusive use of natural gas fuel with no more than 0.2 grains of sulfur per 100 dry standard cubic feet is acceptable as SO_x BACT for the combined cycle, duct burner equipped, natural gas-fired >100 megawatt gas turbines.

VOC and Trace Organic BACT

VOC is a precursor for ozone and PM_{10}, which are non-attainment pollutants at the proposed facility location. VOCs and trace organics are emitted from natural gas-fired turbines as a result of incomplete combustion of fuel and trace organics contained in pipeline-quality natural gas.

The most stringent VOC control level for gas turbines has been achieved by those which employ catalytic oxidation for CO control. An oxidation catalyst designed to control CO would provide a side benefit of controlling in the range of VOC emissions. The HDPP has proposed a high temperature oxidation catalyst achieving approximately 40% destruction of non-methane, non-ethane organic hydrocarbons as VOC BACT. CARB has provided source test data for gas turbines that suggests that the oxidation catalyst proposed by HDPP will result in VOC concentrations on the order of 1 ppmvd.

The District has determined that a maximum VOC concentration of 1.0 ppmvd (corrected to 15% oxygen) averaged over one hour is acceptable as VOC and trace organic BACT for the combined cycle, duct burner equipped, natural gas-fired >100 megawatt gas turbines.

6. Class I Area Visibility Protection

ENSR Corporation evaluated the visibility reduction potential of the HDPP on Prevention of Significant Deterioration (PSD) Class I areas,[4] supplemented by data provided by the applicant on June 19, 1998 and April 9, 1999. The MDAQMD approves of the analysis methods used in the visibility analysis and the findings of the visibility analysis.

Findings

The HDPP was estimated to generate a maximum 24-hour increase in the particle scattering coefficient of 4.4 percent, which is less than the significant change level of 5 percent. The HDPP

[4] "High Desert Power Project Visibility Analysis," ENSR Corp., ENSR Doc. No. 8700-835-400-VIS, January 1998.

plume was estimated to produce maximum ΔE of 0.278 inside a PSD Class I area (the screening criteria for ΔE is 2.00), and contrast of 0.002 inside a PSD Class I area (the screening criteria is 0.050 for contrast).

Inputs and Methods

Visibility impacts were evaluated for each wilderness area within 100 km of the proposed HDPP site: Cucamonga Wilderness Area (41 km), San Gabriel Wilderness Area (52 km) and San Gorgonio Wilderness Area (62 km). In addition, visibility impacts were evaluated for the Joshua Tree National Monument, 101 km from the proposed site. George AFB meteorological data for 1987 through 1991 was used for each analysis. Worst-case one hour emissions were used for each analysis. Plume blight was evaluated using the USEPA screening model (VISCREEN, USEPA 1988) for areas within 50 kilometers of the proposed site. A regional haze analysis was performed for the three Class I areas more than 50 km from the HDPP site using the USEPA approved regional haze visibility screening analysis guidance (*Interagency Working Group on Air Quality Modeling Phase I Report*, USEPA 1993).

7. Air Quality Impact Analysis

HDPP performed the National Ambient Air Quality Standard (NAAQS) and Prevention of Significant Deterioration impact analyses for CO, PM_{10}, SO_2[5] and NO_2[6] emissions. These analyses were later revised to reflect modifications to the proposed project.[7] The MDAQMD approves of the analysis methods used in these impact analyses and the findings of these impact analyses.

Findings

The impact analysis calculated a maximum HDPP incremental increase for each pollutant for each applicable averaging period, as shown in Table Four below. When added to the maximum recent background concentration, the HDPP did not exceed the most stringent (or lowest) standard for any pollutant, except those pollutants for which the background exceeds the standard. The HDPP was estimated to consume a maximum NO_2 increment of 0.0062 $\mu g/m^3$ in a PSD Class I area, which is less than the NO_2 increment threshold of 2.5 $\mu g/m^3$. The HDPP was estimated to consume a maximum NO_2 increment of 0.86 $\mu g/m^3$ in a PSD Class II area, which is less than the overall NO_2 increment threshold of 25 $\mu g/m^3$.

[5] "High Desert Power Project Ambient Air Quality Impact Assessment," ENSR Corp., ENSR Doc. No. 8700-835-400-AQIA, January 1998.

[6] "High Desert power Project NO_x Impact Assessment," ENSR Corp., ENSR Doc. No. 8700-835-400-NO_x, February 1998.

[7] "High Desert Power Project Revised Short-term Air Quality Impact Assessment," ENSR Corp., ENSR Doc. No. 8700-835-400-ST2, November 1998 and letter to M. Haber (USEPA Region IX) from H. Balentine (ENSR) dated April 9, 1999.

Table 4 – HDPP Worst Case Ambient Air Quality Impacts					
	Project Impact	**Background**	**Total Impact**	**Federal Standard**	**State Standard**
Pollutant	*All values in $\mu g/m^3$*				
CO (1 hour)	8000	9200	17200	40000	23000
CO (8 hour)	900	8500	9400	10000	10000
PM_{10} (24 hour)	9	108	117	150	50
PM_{10} (annual)	1	42	43	50	30
SO_2 (3 hour)	2	35	37	1300	n/a
SO_2 (24 hour)	1	26	27	365	n/a
SO_2 (annual)	0	5	5	80	30
NO_2 (1 hour)	235	24	259	n/a	470
NO_2 (annual)	1	51	52	100	n/a

Inputs and Methods

Worst case emissions were used as inputs, meaning 100 percent full load or mixed full load and startup for averaging times longer than one hour, and uncontrolled startup conditions for one hour averaging times. Data from George AFB for 1987 through 1991 was used as the meteorological inputs. Maximum ambient concentration data for 1994 through 1997 from the Victorville site was used for background concentrations. The Ozone Limiting Method was used to estimate the 1-hour maximum NO_2 impact. For determining annual impacts, the conservative assumption of 100 percent conversion of NO_x to NO_2 was used.

The USEPA Industrial Source Complex Short Term Version 97363 (ISCST3) dispersion model was used to estimate ambient concentrations resulting from HDPP emissions. The dispersion modeling was performed according to requirements stated in the Guideline on Air Quality Models (EPA-450/2-78-027R).

8. Health Risk Assessment

HDPP performed a Health Risk Assessment (HRA) for carcinogenic, non-carcinogenic chronic, and non-carcinogenic acute toxic air contaminants.[8] The MDAQMD approves of the analysis methods used in the HRA and the findings of the HRA.

Findings

The HRA calculated a peak 70-year cancer risk of 0.9 per million, located approximately 4 km east-northeast of the HDPP boundary. The calculated peak 70-year residential cancer risk is less than 1.0 per million (for all receptors). The maximum non-cancer chronic and acute Hazard Indices are both less than the significance level of 1.0 (0.1 and 0.8, respectively).

[8] "High Desert Power Project Health Risk Assessment," ENSR Corp., ENSR Doc. No. 8700-835-400-HRA, January 1998, memorandum from H. Balentine (ENSR) to B. Zeller (MDAQMD) dated 4/13/98 (File 8700-835-300), and memorandum from H. Balentine (ENSR) to A. De Salvio (MDAQMD) dated 12/8/98.

Inputs and Methods

The HDPP will emit toxic air contaminants as products of natural gas combustion, equipment wear, ammonia slip from the SCR systems, and cooling tower emissions. Combustion emissions were estimated using emission factors contained in the CARB California Air Toxics Emission Factors database. Toxic metal emissions (chromium, cobalt, nickel and manganese) were estimated by speciating fine particulate exhaust from natural gas combustion using CARB speciation factors (CARB, August 1991, Profile 123). Ammonia slip was assumed to be 10 ppm in the stack exhaust. Cooling tower emissions were estimated using USEPA emission factors for evaporative emissions and engineering calculation for drift droplets. Toxics in the cooling tower drift include: ammonia, chloroform, chlorine, phenols, sulfate, and the metals arsenic, beryllium, cadmium, copper, lead, mercury, nickel, selenium, and zinc.

The USEPA Industrial Source Complex Short Term Version 97363 (ISCST3) dispersion model was used to estimate ambient concentrations of toxic air pollutants. The CAPCOA Assessment of Chemical Exposure for AB2588 Version 93288 (ACE2588) risk assessment model was used to estimate health risks due to exposure to emissions. Surface data from George AFB (1987 through 1991) and upper air data from Desert Rock, Nevada (1987 through 1991) were used as meteorological inputs.

9. Offset Requirements

MDAQMD Regulation XIII – *New Source Review* requires offsets for nonattainment pollutants and their precursors emitted by large, new sources. HDPP has prepared and submitted a proposed offset package for the proposed project as required by Rule 1302(C)(3)(b).[9] The HDPP is proposed for a location that has been designated nonattainment by USEPA for ozone and PM_{10}. MDAQMD Rule 1303(B)(1) specifies offset threshold amounts for the nonattainment pollutant PM_{10}. MDAQMD Rule 1303(B)(1) also specifies offset threshold amounts for precursors of nonattainment pollutants: NO_x (precursor of ozone and PM_{10}), SO_x (precursor of PM_{10}), and VOC (precursor of ozone and PM_{10}). A new facility which emits or has the potential to emit more than these offset thresholds must obtain offsets equal to the facility's entire potential to emit. As Table Five shows, maximum HDPP annual emissions exceed the offset thresholds for three of the four nonattainment pollutants and/or precursors. The table uses HDPP maximum or worst-case annual emissions. The table also includes all applicable emissions, including the emissions increases from proposed new permit units (turbines, duct burners, SCR and wet cooling equipment), cargo carriers (none are proposed), fugitive emissions (none are proposed), and non-permitted equipment (none are proposed). For this analysis the MDAQMD assumes VOC is equivalent to ROC and SO_2 is equivalent to SO_x. SO_x emissions represent that portion of total SO_x emissions not included in back half catch portion of PM_{10} emissions (absolute total SO_x is 14 tpy, but about 9 tpy are assumed to be converted to particulate and are included in the PM_{10} estimate).

[9] "Offset Plan," HDPP LLC, March 19, 1998 and "High Desert Power Project Revised Offset Plan," ENSR Corp., ENSR Doc. No. 8700-835-400-ERC, November 1998.

Table 5 - Comparison of HDPP Emissions with Offset Thresholds All emissions in tons per year				
	NO_x	**VOC**	**SO_x**	**PM_{10}**
Offset Threshold	25	25	25	15
Maximum HDPP Emissions	205	129	14	234
Configuration	3F	3F	3F	3F

Required Offsets

MDAQMD Rule 1305 increases the amount of offsets required based on the location of the facility obtaining the offsets (on a pollutant category specific basis). As the HDPP is located in two nonattainment areas, a federal ozone nonattainment area and a federal PM_{10} nonattainment area, the largest applicable offset ratio applies. Table Six calculates the offsets required for the HDPP.

Table 6 - Emission Offsets Required for the HDPP All emissions in tons per year			
	NO_x	**VOC**	**PM_{10}**
Maximum HDPP Emissions	205	129	234
Offset Ratio	1.3	1.3	1.0
Required Offsets	**267**	**168**	**234**

Identified Emission Reduction Credits

HDPP has identified several sources of emission reduction credits (ERCs). HDPP has executed option agreements or letters of intent with each of these sources. HDPP has submitted sufficient information in advance of an actual ERC application for the City of Adelanto road paving project to support the ERC numbers presented here. USEPA Region IX has no remaining issues regarding these offset sources.[10] The ERC sources are summarized in Table Seven.

Table 7 - ERC Sources Identified by HDPP All emissions in tons per year				
Source	Location	**NO_x**	**VOC**	**PM_{10}**
General Motors Corp. (Van Nuys)	SCAQMD – AQ002610		229	
Mobil Oil Corp. (Torrance)	SCAQMD – AQ002293		73	
Chemoil Refining (Carson)	SCAQMD – AQ002387		43	
Crown Cork & Seal (Los Angeles)	SCAQMD – AQ000771/2		118	
BASF Corp. (Orange County)	SCAQMD – AQ001724		40	
Southern California International Airport Authority (Victorville)	MDAQMD – 0007	134	151	14
City of Adelanto	MDAQMD (pending)			262
	Total ERCs Identified:	**134**	**654**	**276**

[10] Letter from M. Haber (USEPA) to R. Buell (CEC) dated 4/15/99.

Inter-District, Inter-Basin and Inter-Pollutant Offsetting

HDPP has proposed to use inter-district, inter-air basin and inter-pollutant ERC trading to make up for the limited amount of ERCs available within the MDAQMD. The use of inter-district, inter-air basin and inter-pollutant offsets is specifically allowed for by Rule 1305(B)(4) through (6) (in consultation with CARB and USEPA, and in the case of inter-pollutant offsets, with the approval of USEPA). The MDAQMD Governing Board adopted a resolution approving the transfer of VOC ERCs from SCAQMD into MDAQMD by the HDPP on April 26, 1999. The SCAQMD Governing Board adopted a resolution approving this transfer on May 14, 1999.

HDPP is proposing to use VOCs from the South Coast Air Basin within the jurisdiction of SCAQMD to offset VOC and NO_x emissions. The SCAQMD VOC ERCs may be used to offset VOC emissions at a ratio of 1.0:1. The SCAQMD VOC ERCs may be used to offset NO_x emissions at a ratio of 1.6:1. These ratios are in addition to the 1.3:1 offset ratio specified by Rule 1305(C) for NO_x and VOC offsets (as ozone precursors). USEPA has approved of these offset ratios for this case only. [11]

The District therefore determines that this inter-district, inter-basin, and inter-pollutant trade is technically justified and will not cause or contribute to a violation of an ambient air quality standard. The District concludes that a VOC to NO_x ratio of 1.6:1 is acceptable for the VOC ERCs originating within the South Coast Air Basin for the HDPP and is beneficial to both air districts.

10. Applicable Regulations and Compliance Analysis

Selected MDAQMD Rules and Regulations will apply to the proposed project:

Regulation II – Permits

Rule 221 – *Federal Operating Permit Requirement* requires certain facilities to obtain Federal Operating Permits. The proposed project will be required to submit an application for a federal operating permit within twelve months of the commencement of operations.

Regulation IV - Prohibitions

Rule 401 – *Visible Emissions* limits visible emissions opacity to less than 20 percent (or Ringlemann No. 1). During start up, visible emissions may exceed 20 percent opacity. However, emissions of this opacity are not expected to last three minutes or longer. In normal operating mode, visible emissions are not expected to exceed 20 percent opacity.

Rule 402 – *Nuisance* prohibits facility emissions that cause a public nuisance. The proposed turbine power train exhaust is not expected to generate a public nuisance due to the sole use of pipeline-quality natural gas as a fuel. In addition, due to the location of the proposed project, no nuisance complaints are expected.

[11] ibid.

Rule 403 – *Fugitive Dust* specifies requirements for controlling fugitive dust. The proposed project does not include any significant sources of fugitive dust so the proposed project is not expected to violate Rule 403.

Rule 403.2 – *Fugitive Dust Control for the Mojave Desert Planning Area* specifies requirements for construction projects. The construction of the proposed project will be required to comply with the requirements of Rule 403.2.

Rule 404 – *Particulate Matter – Concentration* specifies standards of emissions for particulate matter concentrations. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 404.

Rule 405 – *Solid Particulate Matter - Weight* limits particulate matter emissions from fuel combustion on a mass per unit combusted basis. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 405.

Rule 406 – *Specific Contaminants* limits sulfur dioxide emissions. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 406.

Rule 408 – *Circumvention* prohibits hidden or secondary rule violations. The proposed project is not expected to violate Rule 408.

Rule 409 – *Combustion Contaminants* limits total particulate emissions on a density basis. The sole use of pipeline-quality natural gas a fuel will keep proposed project emission levels in compliance with Rule 409.

Rule 430 – *Breakdown Provisions* requires the reporting of breakdowns and excess emissions. The proposed project will be required to comply with Rule 430 by permit condition.

Rule 431 – *Sulfur Content in Fuels* limits sulfur content in gaseous, liquid and solid fuels. The sole use of pipeline-quality natural gas a fuel will keep the proposed project in compliance with Rule 431.

Rule 475 – *Electric Power Generating Equipment* limits NO_x and particulate matter emissions with mass rate and concentration standards. Permit conditions for the proposed project will establish limits which are in compliance with Rule 475.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX includes by reference the New Source Performance Standard (NSPS) for gas turbines (40 CFR 60 Subpart GG, §§60.330 through 60.334). Permit conditions for the proposed project will establish limits which are in compliance with the gas turbine NSPS referenced in Regulation IX.

Regulation XII – Federal Operating Permits

Regulation XII contains requirements for sources which must have a federal operating permit and an acid rain permit. The proposed project will be required to submit applications for a federal operating permit and an acid rain permit by the appropriate date.

Regulation XIII – New Source Review

Rule 1300 – *General* ensures that Prevention of Significant Deterioration (PSD) requirements apply to all projects. The proposed project has submitted an application to the USEPA for an NO_2 and CO PSD permit, complying with Rule 1300.

Rule 1302 – *Procedure* requires certification of compliance with the Federal Clean Air Act, applicable implementation plans, and all applicable MDAQMD rules and regulations. The ATC application package for the proposed project includes sufficient documentation to comply with Rule 1302(D)(5)(b)(iii). Permit conditions for the proposed project will require compliance with Rule 1302(D)(5)(b)(iv).

Rule 1303 – *Requirements* requires BACT and offsets for selected large new sources. Permit conditions will limit the emissions from the proposed project to a level which has been defined as BACT for the proposed project, bringing the proposed project into compliance with Rule 1302(A). Prior to the commencement of construction the proposed project shall have obtained sufficient offsets to comply with Rule 1303(B)(1).

Rule 1306 – *Electric Energy Generating Facilities* places additional administrative requirements on projects involving approval by the California Energy Commission (CEC). The proposed project will not receive an ATC without CEC's approval of their Application for Certification, ensuring compliance with Rule 1306.

Maximum Achievable Control Technology Standards

Health & Safety Code §39658(b)(1) states that when USEPA adopts a standard for a toxic air contaminant pursuant to §112 of the Federal Clean Air Act (42 USC §7412), such standard becomes the Airborne Toxic Control Measure (ATCM) for the toxic air contaminant. Once an ATCM has been adopted it becomes enforceable by the MDAQMD 120 days after adoption or implementation (Health & Safety Code §39666(d)). USEPA has not to date adopted a Maximum Achievable Control Technology (MACT) standard that is applicable to the proposed project. Should USEPA adopt an applicable MACT in the future, the MDAQMD will be required to enforce said MACT as an ATCM on the proposed project.

11. Conclusion

The MDAQMD has reviewed the proposed project's Application for New Source Review and subsequent supplementary information. The MDAQMD has determined that the proposed project, after application of the permit conditions (including BACT requirements) given below, will comply with all applicable MDAQMD Rules and Regulations. This FDOC will be publicly noticed on or about June 30, 1999, including copies to CARB and USEPA. This FDOC will remain available for public inspection.

12. Permit Conditions

The following permit conditions will be placed on the Authorities to Construct for the project. Separate permits will be issued for each turbine power train, irrespective of final configuration. Separate permits will also be issued for each SCR system, oxidation catalyst, duct burner and cooling tower. The electronic version of this document contains a set of conditions that are essentially identical for each of multiple pieces of equipment, differing only in District permit reference numbers. The signed and printed FDOC will have printed permits (with descriptions and conditions) in place of condition language listings.

3F Configuration Turbine Power Train Authority to Construct Conditions

[3 individual 1711 MMBtu/hr F Class Gas Turbine Generators,
Permit Numbers: B005266, B005267 and B005268]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be exclusively fueled with pipeline quality natural gas with a sulfur content not exceeding 0.2 grains per 100 dscf on a rolling twelve month average basis, and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment is subject to the federal NSPS codified at 40 CFR Part 60, Subparts A (General Provisions) and GG (Standards of Performance for Stationary Gas Turbines). This equipment is also subject to the Prevention of Significant Deterioration (40 CFR 51.166) and Federal Acid Rain (Title IV) programs. Compliance with all applicable provisions of these regulations is required.

4. Emissions from this equipment (including its associated duct burner) shall not be exceed the following emission limits at any firing rate, except for CO, NO_x and VOC during periods of startup, shutdown and malfunction:
   a. Hourly rates, computed every 15 minutes, verified by CEMS and annual compliance tests:
      i. NO_x as NO_2 – 18.00 lb/hr (based on 2.5 ppmvd corrected to 15% O_2 and averaged over one hour)
      ii. CO – 17.53 lb/hr (based on 4.0 ppmvd corrected to 15% O_2 and averaged over 24 hours)
      iii. Ammonia Slip – 10 ppmvd (corrected to 15% O_2 and averaged over three hours)
   b. Hourly rates, verified by annual compliance tests or other compliance methods in the case of SOx:
      i. VOC as CH_4 – 2.51 lb/hr (based on 1 ppmvd corrected to 15% O_2)
      ii. SO_x as SO_2 – 1.11 lb/hr (based on 0.00064 lb/MMBtu (lower heating value))
      iii. PM_{10} – 18.14 lb/hr

5. Emissions of CO and NO_x from this equipment may exceed the limits contained in Condition 4 during startup and shutdown periods as follows:
    a. Startup shall be defined as the period beginning with ignition and lasting until the equipment has reached operating permit limits. Cold startup means a startup when the CTG has not been in operation during the preceding 72 hours. Hot startup means a startup when the CTG has been in operation during the preceding 8 hours. Warm startup means a startup that is not a hot or cold startup. Shutdown shall be defined as the period beginning with the lowering of equipment from base load and lasting until fuel flow is completely off and combustion has ceased.
    b. Transient conditions shall not exceed the following durations:
        i. Cold startup – 4.5 hours
        ii. Warm startup – 2.6 hours
        iii. Hot startup – 1.9 hours
        iv. Shutdown – 1 hour
    c. During a cold startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 183 lb
        ii. CO – 3541 lb
    d. During a warm startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 168 lb
        ii. CO – 3596 lb
    e. During a hot startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 138 lb
        ii. CO – 3729 lb
    f. During a shutdown emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 97 lb
        ii. CO – 239 lb

6. Emissions from this equipment, including the duct burner, may not exceed the following emission limits, based on a calendar day summary:
    a. NO_x – 848 lb/day, verified by CEMS
    b. CO – 8072 lb/day, verified by CEMS
    c. VOC as CH_4 – 1448 lb/day, verified by compliance tests and hours of operation in mode
    d. SO_x as SO_2 – 26.7 lb/day, verified by fuel sulfur content and fuel use data
    e. PM_{10} – 435 lb/day, verified by compliance tests and hours of operation

7. Emissions from this facility, including the cooling towers, may not exceed the following emission limits, based on a rolling 12 month summary:
    a. NO_x – 205 tons/year, verified by CEMS
    b. CO – 750 tons/year, verified by CEMS
    c. VOC as CH_4 – 129 tons/year, verified by compliance tests and hours of operation in mode
    d. SO_x as SO_2 – 14 tons/year, verified by fuel sulfur content and fuel use data
    e. PM_{10} – 233.2 tons/year, verified by compliance tests and hours of operation

8. Particulate emissions from this equipment shall not exceed an opacity equal to or greater than twenty percent (20%) for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor.

9. This equipment shall exhaust through a stack at a minimum height of 130 feet.

10. The owner/operator (o/o) shall not operate this equipment without the selective catalytic NO_x reduction (insert Permit No. here) and VOC and CO oxidation catalyst (insert Permit No. here) systems installed and fully functional.

11. Emissions of NO_x, CO, O_2 and ammonia slip shall be monitored using a Continuous Emissions Monitoring System (CEMS). Turbine fuel consumption shall be monitored using a continuous monitoring system. Stack gas flow rate shall be monitored using a Continuous Emission Rate Monitoring System (CERMS). The operator shall, install, calibrate, maintain, and operate these monitoring systems according to an MDAQMD-approved monitoring plan and MDAQMD Rule 218, and shall be installed prior to initial equipment startup. Six (6) months prior to installation the operator shall submit a monitoring plan for MDAQMD review and approval.

12. The o/o shall conduct all required compliance/certification tests in accordance with an MDAQMD-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for MDAQMD review and approval. Written notice of the compliance/certification test shall be provided to the MDAQMD ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the MDAQMD within forty-five (45) days after testing.

13. The o/o shall perform the following annual compliance tests in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the MDAQMD no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
    a. NO_x as NO_2 in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Methods 19 and 20).
    b. VOC as CH_4 in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Methods 25A and 18).
    c. SO_x as SO_2 in ppmvd at 15% O_2 and lb/hr.
    d. CO in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Method 10).
    e. PM_{10} in mg/m^3 at 15% O_2 and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).
    f. Flue gas flow rate in scfmd.
    g. Opacity (measured per USEPA reference Method 9).
    h. Ammonia slip in ppmvd at 15% O_2.

14. The o/o shall, at least as often as once every five years (commencing with the initial compliance test), include the following supplemental source tests in the annual compliance testing:
    a. Characterization of cold startup VOC emissions;
    b. Characterization of warm startup VOC emissions;
    c. Characterization of hot startup VOC emissions; and
    d. Characterization of shutdown VOC emissions.

15. Continuous monitoring systems shall meet the following acceptability testing requirements from 40 CFR 60 Appendix B:
    a. For NO_x, Performance Specification 2.
    b. For O_2, Performance Specification 3.
    c. For CO, Performance Specification 4.
    d. For stack gas flow rate, Performance Specification 6.
    e. For ammonia, a District approved procedure that is to be submitted by the o/o.

16. The o/o shall submit to the APCO and USEPA Region IX the following information for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year this permit is in effect. Each January 30 submittal shall include a summary of the reported information for the previous year. This information shall be maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.
    a. Operating parameters of emission control equipment, including but not limited to ammonia injection rate, NO_x emission rate and ammonia slip.
    b. Total plant operation time (hours), number of startups, hours in cold startup, hours in warm startup, hours in hot startup, and hours in shutdown.
    c. Date and time of the beginning and end of each startup and shutdown period.
    d. Average plant operation schedule (hours per day, days per week, weeks per year).
    e. All continuous emissions data reduced and reported in accordance with the District approved CEMS protocol.
    f. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, PM_{10}, VOC and SO_x (including calculation protocol).
    g. Fuel sulfur content (monthly laboratory analyses, monthly natural gas sulfur content reports from the natural gas supplier(s), or the results of a custom fuel monitoring schedule approved by USEPA for compliance with the fuel monitoring provisions of 40 CFR 60 Subpart GG)
    h. A log of all excess emissions, including the information regarding malfunctions/breakdowns required by Rule 430.
    i. Any permanent changes made in the plant process or production which would affect air pollutant emissions, and indicate when changes were made.
    j. Any maintenance to any air pollutant control system (recorded on an as-performed basis).

17. The o/o must surrender to the District sufficient valid Emission Reduction Credits for this equipment before the start of construction of any part of the project for which this equipment is intended to be used. In accordance with Regulation XIII the operator shall

obtain 267 tons of NO_x, 168 tons of VOC, and 234 tons of PM_{10} offsets (VOC ERCs from SCAQMD may be used as VOC ERCs at a rate of 1:1 or may be substituted for NO_x ERCs at a rate of 1.6:1).

18. During an initial commissioning period of no more than 120 days, commencing with the first firing of fuel in this equipment, NO_x, CO, VOC and ammonia concentration limits shall not apply.

19. The o/o shall provide stack sampling ports and platforms necessary to perform source tests required to verify compliance with District rules, regulations and permit conditions. The location of these ports and platforms shall be subject to District approval.

20. Within 60 days after achieving the maximum firing rate at which the facility will be operated, but not later than 180 days after initial startup, the operator shall perform an initial compliance test. This test shall demonstrate that this equipment is capable of operation at 100% load in compliance with the emission limits in Condition 4.

21. The initial compliance test shall include tests for the following. The results of the initial compliance test shall be used to prepare a supplemental health risk analysis.
    a. Aldehydes and acrolein (measured per CARB method 430);
    b. Certification of CEMS and CERMS at 100% load, startup modes and shutdown mode;
    c. Characterization of cold startup VOC emissions;
    d. Characterization of warm startup VOC emissions;
    e. Characterization of hot startup VOC emissions; and
    f. Characterization of shutdown VOC emissions.

22. Only one of the following configurations may be constructed at this site: the 3F combined cycle configuration, consisting of three F-class turbines and auxiliary equipment; or the 2G combined cycle configuration, consisting of two G-class turbines and auxiliary equipment.

3F Configuration Duct Burner Authority to Construct Conditions

[3 individual 150 MMBtu/hr Natural Gas Duct Burners,
Permit Numbers: B005269, B005270, and B005271]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be exclusively fueled with natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The duct burner shall not be operated unless the associated turbine power train (insert permit No. here) and selective catalytic NO_x reduction system (insert permit No. here) are in operation.

4. Fuel use by this equipment shall be recorded and maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

3F Configuration Selective Catalytic NO_x Reduction System Authority to Construct Conditions

[3 individual SCR systems, Permit Numbers: C005272, C005273, and C005274]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the gas turbine covered in valid MDAQMD permit (insert Permit No. here).

4. Ammonia shall be injected whenever the selective catalytic reduction system has reached or exceeded 550° Fahrenheit except for periods of equipment malfunction. Except during periods of startup, shutdown and malfunction, ammonia slip shall not exceed 10 ppm volume dry at 15 percent O_2.

5. Ammonia injection by this equipment in pounds per hour shall be recorded and maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

3F Configuration VOC and CO Oxidation Catalyst Authority to Construct Conditions

[3 individual High Temperature Oxidation Catalysts,
Permit Numbers: C005275, C005276, and C005277]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the gas turbine covered in valid MDAQMD permit (insert Permit No. here).

3F Configuration Cooling Tower Authority to Construct Conditions

[3 individual Cooling Towers, Permit Numbers: B005278, B005279, and B005280]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The drift rate shall not exceed 0.0006 percent with a maximum circulation rate of 57,300 gallons per minute. The maximum hourly PM_{10} emission rate shall not exceed 1.1 pounds per hour, as calculated per the written District-approved protocol.

4. The operator shall perform weekly tests of the blow-down water quality. The operator shall maintain a log which contains the date and result of each blow-down water quality test, and the resulting mass emission rate. This log shall be maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

5. The operator shall conduct all required cooling tower water quality tests in accordance with an MDAQMD-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test the operator shall provide a written test and emissions calculation protocol for MDAQMD review and approval.

6. A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept on-site and be available to MDAQMD personnel on request.

2G Configuration Turbine Power Train Authority to Construct Conditions

[2 individual 2230 MMBtu/hr G Class Gas Turbine Generators,
Permit Numbers: B005281 and B005282]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be exclusively fueled with pipeline quality natural gas with a sulfur content not exceeding 0.2 grains per 100 dscf on a rolling twelve month average basis, and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment is subject to the federal NSPS codified at 40 CFR Part 60, Subparts A (General Provisions) and GG (Standards of Performance for Stationary Gas Turbines). This equipment is also subject to the Prevention of Significant Deterioration (40 CFR 51.166) and Federal Acid Rain (Title IV) programs. Compliance with all applicable provisions of these regulations is required.

4. Emissions from this equipment (including its associated duct burner) shall not be exceed the following emission limits at any firing rate, except for CO, NO_x and VOC during periods of startup, shutdown and malfunction:
    a. Hourly rates, computed every 15 minutes, verified by CEMS and annual compliance tests:
        i. NO_x as NO_2 – 24.55 lb/hr (based on 2.5 ppmvd corrected to 15% O_2 and averaged over one hour)
        ii. CO – 23.91 lb/hr (based on 4.0 ppmvd corrected to 15% O_2 and averaged over 24 hours)
        iii. Ammonia Slip – 10 ppmvd (corrected to 15% O_2 and averaged over three hours)
    b. Hourly rates, verified by annual compliance tests or other compliance methods in the case of SOx:
        i. VOC as CH_4 – 3.42 lb/hr (based on 1 ppmvd corrected to 15% O_2)
        ii. SO_x as SO_2 – 1.51 lb/hr (based on 0.00064 lb/MMBtu (lower heating value))
        iii. PM_{10} – 25.41 lb/hr

5. Emissions of CO and NO_x from this equipment may exceed the limits contained in Condition 4 during startup and shutdown periods as follows:
    a. Startup shall be defined as the period beginning with ignition and lasting until the equipment has reached operating permit limits. Cold startup means a startup when the CTG has not been in operation during the preceding 72 hours. Hot startup means a startup when the CTG has been in operation during the preceding 8 hours. Warm startup means a startup that is not a hot or cold startup. Shutdown shall be defined as the period beginning with the lowering of equipment from base load and lasting until fuel flow is completely off and combustion has ceased.
    b. Transient conditions shall not exceed the following durations:
        i. Cold startup – 4.5 hours
        ii. Warm startup – 2.6 hours
        iii. Hot startup – 1.9 hours
        iv. Shutdown – 1 hour
    c. During a cold startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 561 lb
        ii. CO – 6890 lb
    d. During a warm startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 269 lb
        ii. CO – 3177 lb
    e. During a hot startup emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 215 lb
        ii. CO – 2711 lb
    f. During a shutdown emissions shall not exceed the following, verified by CEMS:
        i. NO_x – 133 lb
        ii. CO – 288 lb

6. Emissions from this equipment, including the duct burner, may not exceed the following emission limits, based on a calendar day summary:
   a. NO_x – 1495 lb/day, verified by CEMS
   b. CO – 10619 lb/day, verified by CEMS
   c. VOC as CH_4 – 1648 lb/day, verified by compliance tests and hours of operation in mode
   d. SO_x as SO_2 – 36.2 lb/day, verified by fuel sulfur content and fuel use data
   e. PM_{10} – 610 lb/day, verified by compliance tests and hours of operation

7. Emissions from this facility, including the cooling towers, may not exceed the following emission limits, based on a rolling 12 month summary:
   a. NO_x – 189 tons/year, verified by CEMS
   b. CO – 484 tons/year, verified by CEMS
   c. VOC as CH_4 – 83 tons/year, verified by compliance tests and hours of operation in mode
   d. SO_x as SO_2 – 12 tons/year, verified by fuel sulfur content and fuel use data
   e. PM_{10} – 219 tons/year, verified by compliance tests and hours of operation

8. Particulate emissions from this equipment shall not exceed an opacity equal to or greater than twenty percent (20%) for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor.

9. This equipment shall exhaust through a stack at a minimum height of 130 feet.

10. The owner/operator (o/o) shall not operate this equipment without the selective catalytic NO_x reduction (insert Permit No. here) and VOC and CO oxidation catalyst (insert Permit No. here) systems installed and fully functional.

11. Emissions of NO_x, CO, O_2 and ammonia slip shall be monitored using a Continuous Emissions Monitoring System (CEMS). Turbine fuel consumption shall be monitored using a continuous monitoring system. Stack gas flow rate shall be monitored using a Continuous Emission Rate Monitoring System (CERMS). The operator shall, install, calibrate, maintain, and operate these monitoring systems according to an MDAQMD-approved monitoring plan and MDAQMD Rule 218, and shall be installed prior to initial equipment startup. Six (6) months prior to installation the operator shall submit a monitoring plan for MDAQMD review and approval.

12. The o/o shall conduct all required compliance/certification tests in accordance with an MDAQMD-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for MDAQMD review and approval. Written notice of the compliance/certification test shall be provided to the MDAQMD ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the MDAQMD within forty-five (45) days after testing.

13. The o/o shall perform the following annual compliance tests in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the MDAQMD no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
    a. NO_x as NO_2 in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Methods 19 and 20).
    b. VOC as CH_4 in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Methods 25A and 18).
    c. SO_x as SO_2 in ppmvd at 15% O_2 and lb/hr.
    d. CO in ppmvd at 15% O_2 and lb/hr (measured per USEPA Reference Method 10).
    e. PM_{10} in mg/m^3 at 15% O_2 and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).
    f. Flue gas flow rate in scfmd.
    g. Opacity (measured per USEPA reference Method 9).
    h. Ammonia slip in ppmvd at 15% O_2.

14. The o/o shall, at least as often as once every five years (commencing with the initial compliance test), include the following supplemental source tests in the annual compliance testing:
    a. Characterization of cold startup VOC emissions;
    b. Characterization of warm startup VOC emissions;
    c. Characterization of hot startup VOC emissions; and
    d. Characterization of shutdown VOC emissions.

15. Continuous monitoring systems shall meet the following acceptability testing requirements from 40 CFR 60 Appendix B:
    a. For NO_x, Performance Specification 2.
    b. For O_2, Performance Specification 3.
    c. For CO, Performance Specification 4.
    d. For stack gas flow rate, Performance Specification 6.
    e. For ammonia, a District approved procedure that is to be submitted by the o/o.

16. The o/o shall submit to the APCO and USEPA Region IX the following information for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year this permit is in effect. Each January 30 submittal shall include a summary of the reported information for the previous year. This information shall be maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.
    a. Operating parameters of emission control equipment, including but not limited to ammonia injection rate, NO_x emission rate and ammonia slip.
    b. Total plant operation time (hours), number of startups, hours in cold startup, hours in warm startup, hours in hot startup, and hours in shutdown.
    c. Date and time of the beginning and end of each startup and shutdown period.
    d. Average plant operation schedule (hours per day, days per week, weeks per year).
    e. All continuous emissions data reduced and reported in accordance with the District approved CEMS protocol.

f. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, PM_{10}, VOC and SO_x (including calculation protocol).
g. Fuel sulfur content (monthly laboratory analyses, monthly natural gas sulfur content reports from the natural gas supplier(s), or the results of a custom fuel monitoring schedule approved by USEPA for compliance with the fuel monitoring provisions of 40 CFR 60 Subpart GG)
h. A log of all excess emissions, including the information regarding malfunctions/breakdowns required by Rule 430.
i. Any permanent changes made in the plant process or production which would affect air pollutant emissions, and indicate when changes were made.
j. Any maintenance to any air pollutant control system (recorded on an as-performed basis).

17. The o/o must surrender to the District sufficient valid Emission Reduction Credits for this equipment before the start of construction of any part of the project for which this equipment is intended to be used. In accordance with Regulation XIII the operator shall obtain 246 tons of NO_x, 108 tons of VOC, and 219 tons of PM_{10} offsets (VOC ERCs from SCAQMD may be used as VOC ERCs at a rate of 1:1 or may be substituted for NO_x ERCs at a rate of 1.6:1).

18. During an initial commissioning period of no more than 120 days, commencing with the first firing of fuel in this equipment, NO_x, CO, VOC and ammonia concentration limits shall not apply.

19. The o/o shall provide stack sampling ports and platforms necessary to perform source tests required to verify compliance with District rules, regulations and permit conditions. The location of these ports and platforms shall be subject to District approval.

20. Within 60 days after achieving the maximum firing rate at which the facility will be operated, but not later than 180 days after initial startup, the operator shall perform an initial compliance test. This test shall demonstrate that this equipment is capable of operation at 100% load in compliance with the emission limits in Condition 4.

21. The initial compliance test shall include tests for the following. The results of the initial compliance test shall be used to prepare a supplemental health risk analysis.
    a. Aldehydes and acrolein (measured per CARB method 430);
    b. Certification of CEMS and CERMS at 100% load, startup modes and shutdown mode;
    c. Characterization of cold startup VOC emissions;
    d. Characterization of warm startup VOC emissions;
    e. Characterization of hot startup VOC emissions; and
    f. Characterization of shutdown VOC emissions.

22. Only one of the following configurations may be constructed at this site: the 3F combined cycle configuration, consisting of three F-class turbines and auxiliary equipment; or the 2G combined cycle configuration, consisting of two G-class turbines and auxiliary equipment.

2G Configuration Duct Burner Authority to Construct Conditions

[2 individual 185 MMBtu/hr Natural Gas Duct Burners,
Permit Numbers: B005283 and B005284]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be exclusively fueled with natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The duct burner shall not be operated unless the associated turbine power train (insert permit No. here) and selective catalytic NO_x reduction system (insert permit No. here) are in operation.

4. Fuel use by this equipment shall be recorded and maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

2G Configuration Selective Catalytic NO_x Reduction System Authority to Construct Conditions

[2 individual SCR systems, Permit Numbers: C005285 and C005286]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the gas turbine covered in valid MDAQMD permit (insert Permit No. here).

4. Ammonia shall be injected whenever the selective catalytic reduction system has reached or exceeded 550° Fahrenheit except for periods of equipment malfunction. Except during periods of startup, shutdown and malfunction, ammonia slip shall not exceed 10 ppm volume dry at 15 percent O_2.

5. Ammonia injection by this equipment in pounds per hour shall be recorded and maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

2G Configuration VOC and CO Oxidation Catalyst Authority to Construct Conditions

[2 individual High Temperature Oxidation Catalysts, Permit Numbers: C005287 and C005288]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the gas turbine covered in valid MDAQMD permit (insert Permit No. here).

2G Configuration Cooling Tower Authority to Construct Conditions

[2 individual Cooling Towers, Permit Numbers: B005289 and B005290]

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The drift rate shall not exceed 0.0006 percent with a maximum circulation rate of 73,540 gallons per minute. The maximum hourly PM_{10} emission rate shall not exceed 1.6 pounds per hour, as calculated per the written District-approved protocol.

4. The operator shall perform weekly tests of the blow-down water quality. The operator shall maintain a log which contains the date and result of each blow-down water quality test, and the resulting mass emission rate. This log shall be maintained on site for a minimum of five (5) years and shall be provided to MDAQMD personnel on request.

5. The operator shall conduct all required cooling tower water quality tests in accordance with an MDAQMD-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test the operator shall provide a written test and emissions calculation protocol for MDAQMD review and approval.

6. A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept on-site and be available to MDAQMD personnel on request.